Nitrogen cycle of agricultural system in Field Science Center, Tohoku University (Biological Interactions in Arable Land-Grassland-Forest Continuums and their Impact on the Ecosystem Functions, 7th International Symposium on Integrated Field Science)

Nitrogen cycle of agricultural system in Field Science Center, Tohoku University

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In Japan, large losses of nitrogen from arable and livestock farming threat the environment. Therefore, nitrogen should be used more efficiently by collaboration between arable and livestock farming systems. To reduce the nitrogen loss, nitrogen balance in agricultural systems should be more accurately estimated. In this study, we assessed nitrogen balance in Field Science Center, Tohoku University, using the data of bulletin and some literatures. The Field Science Center is composed of the integrated system of arable and livestock farms. In the arable farm (60 ha), rice, potato, some vegetables and forage crops are grown. In the livestock farm, about 200 head of cattle are raised for dairy and beef production. Compost from livestock is used in the arable farm.

We estimated the nitrogen cycle in Field Science Center in 2007. The nitrogen loss was estimated to be 12.7 tN/yr. The output as products was 2.3 tN/yr, while the input from chemical fertilizer, feed and litter straw were 5.9, 7.4 and 0.3 tN/yr, respectively. Forage crop and litter straw (6.2 tN/yr) were supplied from arable land to livestock. The amount of animal waste was about 10.3 tN/yr. It was partially composted, and the compost (3.5 tN/yr) was supplied to arable land. Consequently, the input-output ratio was calculated as about 17 %. To improve the environmental performance of the Field Science Center, future direction will be discussed.

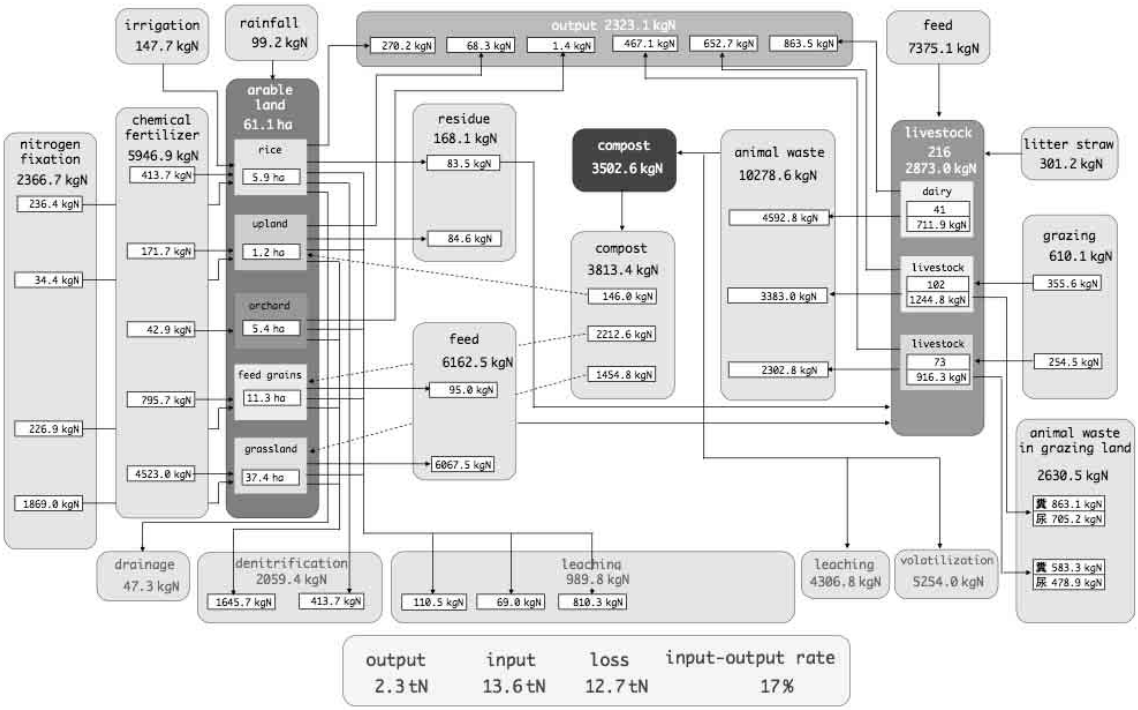

Fig. 1. Nitrogen cycle of agricultural system in the Field Science Center in 2007.